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**PRE-PERMIT CONSTRUCTION APPROVAL
AND PERMIT TO CONSTRUCT APPLICATION for
CARGILL ENVIRONMENTAL FINANCE
KETTLE BUTTE DAIRY
ROBERTS, IDAHO**

August 28, 2008

Kleinfelder Project Number: 96227

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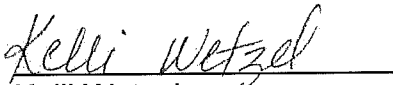
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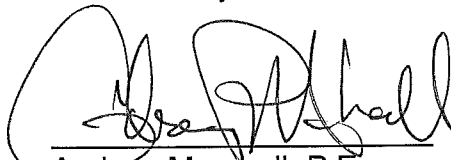
**PRE-PERMIT CONSTRUCTION APPROVAL
AND PERMIT TO CONSTRUCT APPLICATION**
for CARGILL ENVIRONMENTAL FINANCE
KETTLE BUTTE DAIRY
20 North 2100 East
Roberts, Idaho 83444

Kleinfelder Job No: 96227

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August 28, 2008

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1 PROCESS DESCRIPTION

Cargill Environmental Finance proposes to construct an anaerobic digester renewable energy system on property leased from the Kettle Butte Dairy. The site is located in Roberts, Idaho and presented in Figures 1 through 3. The facility is within Jefferson County, Idaho which is designated attainment or unclassifiable for criteria pollutants.

1.1. Process Description

Manure from the dairy will be pumped into an anaerobic digester where the natural digestion process will produce methane rich bio-gas. The hydrogen sulfide content of the bio-gas will be reduced using a bio-scrubber conditioning system. The conditioned bio-gas will fuel two Genset reciprocating internal combustion engines. The Genset generators will produce electricity that will be sold to the local utility. Heat produced from the Genset electrical generators will be used to maintain the digester at an optimum operating temperature and as process heat for the dairy. The waste liquid in post digester manure is separated and will be utilized for irrigation and fertilizer. The solids will be used for cattle bedding and/or a soil amendment. A process flow diagram is presented in Figure 4.

The proposed project includes the installation of the manure digester, bio-gas conditioning system and Genset generators. The Kettle Butte Dairy will operate the dairy and manage the solids and wastewater generated by the process. This permit application is being submitted to obtain approval for construction and operation of the proposed project. Air emissions from the system are released through the two stacks associated with the Genset generators and an emergency flare that would be used in the event the generators are taken offline.

The proposed anaerobic digester renewable energy system will be operated by Cargill Environmental Finance on property leased from the Kettle Butte Dairy. The generators and the flare emissions will result in criteria pollutant emissions of carbon monoxide, particulate matter, nitrogen oxides, sulfur dioxide and volatile organic compounds. The generators will also emit toxic air pollutants (TAPs).

1.2. Facility Classifications

SIC: 4911

The facility is classified by the Standard Industrial Classification # 4911 for Electric Services.

NAICS: 237130

The facility is classified by the North American Industry Classification System # 237130 for Alternative Energy Structure Construction.

2 PRE PERMIT CONSTRUCTION ELIGIBILITY

Pre-permit construction approval is available for new minor sources that do not use emissions netting to stay below major source levels. The proposed project meets all of the pre-permit construction eligibility requirements. The emission calculations and data source reference information are provided in this application.

Cargill Environmental Finance is requesting from IDEQ the ability to commence construction of the source before receiving the required permit to construct. The owner understands that proceeding with construction prior to receiving the required permit to construct is at their own risk. This request is presented in the cover letter for this application.

The pre-permit construction process requires a meeting with IDEQ representatives before submitting the pre-permit construction permit. Kleinfelder representatives met with Kevin Schilling, Bill Rogers and Harbi Elshafei of IDEQ on April 9, 2008 to discuss the project and pre-permit application.

An informational meeting has been scheduled at the Idaho Falls Public Library on September 4, 2008. The meeting announcement was published in the *Idaho Falls Post Register*. A copy of the notice published in the Idaho Falls Post Register is presented in Appendix E.

3 APPLICABLE REQUIREMENTS

3.1. Major or Minor Facility Designation

The proposed project is considered a minor facility based on it's potential to emit. Please see detailed emission calculations in Appendix D.

Designated: ☐ Yes ☒ No
 Potential To Emit: 68.4 tons/yr
 Pollutant which defines Potential to Emit: Carbon Monoxide

3.2. Federal Requirements

No federal regulations other than NSPS SubPart JJJJ (40 CFR 60) are applicable to the proposed project.

The engines will be manufactured after June 1, 2008 and have a capacity greater than 500 hp but less than 1,350 hp and construction of the project will commence after June 12, 2006. Therefore, in accordance with 40 CFR 60.2430, 40 CFR 60, Subpart JJJJ is applicable to this project.

The following NSPS emission standards are applicable to the proposed generators

Table 3-1
Summary of 40 CFR 60, Subpart JJJJ Table 1.

Engine Type and Fuel	Maximum engine power	Manufacturer Date	Emission standards ^a					
			g/HP-hr			ppmvd at 15% O ₂		
			NO _x	CO	VOC ^b	NO _x	CO	VOC ^b
Digester Gas (except lean burn 500≥HP<1,350)	HP≥500	7/1/2007	3.0	5.0	1.0	220	610	80
Digester Gas Lean Burn	500≥HP<1,350	1/1/2008	3.0	5.0	1.0	220	610	80

^a Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15% O₂.

^b For the purposes of this subpart, when calculating emissions of volatile organic compounds (VOC), emission of formaldehyde should not be included.

The requirements of 40 CFR 60.4233(f) are applicable to this project. A maintenance plan and records of conducted maintenance will be prepared and available at the site. An initial performance test will be conducted in accordance with the NSPS requirements and subsequent performance testing conducted every 8,760 hours of operation or 3-years which ever comes first. Performance testing will be completed in accordance with the procedures in 40 CFR 60, Subpart JJJJ, Table 2.

40CFR 60.4243(g) does not apply to this application. The engines do not require three-way catalysts /non-selective catalytic reduction to meet the emission standards because they are lean burn engines and not rich burning engines. EPA's interpretation of the applicability of this requirement for these types of engines is included in Appendix F.

Notifications will be made in accordance with the NSPS general provisions and Section 60.4245 of 40 CFR 60, Subpart JJJJ.

3.3. Rules for the Control of Air Pollution in Idaho (IDAPA 58.01.01)

IDAPA 58.01.01.123 Certification of Documents

Based on information and belief formed after reasonable inquiry, all statements and information contained in the application are true, accurate, and complete.

IDAPA 58.01.01.128 Confidential Information

The information submitted in the application is subject to public disclosure unless submitted under a secret trade claim.

IDAPA 58.01.01.130 Startup Shutdown, Scheduled Maintenance, Safety Measures, upset and Breakdown

If an excess emission event occurs during startup shutdown, scheduled maintenance, safety measures, upset or breakdown, Cargill Environmental Finance will comply with IDAPA 58.01.01.130 through IDAPA 58.01.01.136.

IDAPA 58.01.01.156 Total Compliance

Cargill Environmental Finance understands that when more than one section of rules applies then all such rules must be met to be considered in compliance.

IDAPA 58.01.01.201 Permit to Construct Required

Cargill Environmental Finance's will obtain a permit to construct from the Department which satisfies the requirements of Sections 200 through 208. The proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules.

IDAPA 58.01.01.203 Permit Requirements for New and Modified Stationary Sources

This permit application demonstrates that the project will comply with all applicable emissions standards, ambient air quality standards, and toxic increments. See the modeling report attached in Appendix B.

IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards

This permit application demonstrates preconstruction compliance with the Toxic Standards. See the ambient impacts assessment in Section 5.

IDAPA 58.01.01.223 Exemption Criteria, Recordkeeping, and Reporting for Toxic Air Pollutant Emissions

The proposed project does not meet the exemption criteria specified in sections 01 through 04 of Section 223.

IDAPA 58.01.01.300 Procedures and Requirements of Tier I operating Permits

The facility is not considered a major source and not subject to these requirements.

IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

The proposed project meets the ambient air quality standards specified in Section 577. See the ambient impacts assessment in Section 5.

IDAPA 58.01.01.578 Designation of Attainment, Unclassifiable, and Nonattainment Areas

The proposed project is located in Jefferson County which is currently classified as unclassifiable or attainment for criteria pollutants. Cargill Environmental Finance acknowledges that DEQ annually reviews areas for classification.

IDAPA 58.01.01.585 Toxic Air Pollutants Non-Carcinogenic Increments

The proposed project will result in emissions of non-carcinogenic toxic air pollutants including acrolein, isomers of xylene, selenium, styrene, toluene, and trichloroethylene. These emissions will not exceed their respective screening emission levels. See the ambient impacts assessment in Section 5.

IDAPA 58.01.01.586 Toxic Air Pollutants Carcinogenic Increments

The proposed project will result in potential emissions of carcinogenic toxic air pollutants including acetaldehyde, benzene, dichloromethane, formaldehyde, dichloroethylene, nickel and vinyl chloride. The emissions of acetaldehyde, dichloromethane, trichloroethylene, and vinyl chloride do not exceed their respective screening emission levels, however emissions for benzene, formaldehyde, and nickel have potential to exceed each of their respective screening emission levels. Modeling results indicate all emissions for carcinogenic toxic air pollutants are below their respective AACCs. See the ambient impacts assessment in Section 5.

IDAPA 58.01.01.590 New Source Performance Standards

Cargill Environmental Finance acknowledges that the proposed project must comply with the NSPS set forth in 40 CFR Part 60.

IDAPA 58.01.01.591 National Emission Standards for Hazardous Air Pollutants

The proposed project complies with 40 CFR Part 61 and 40 CFR Part 63.

IDAPA 58.01.01.625 Visible Emissions

Cargill Environmental Finance will not discharge any air pollutant which is greater than 20% opacity from the stacks for more than 3 minutes in a 60 minute period. Cargill will comply with specified test methods and procedures.

IDAPA 58.01.01.650 & 651 Rules for the Control of Fugitive Emissions & General Rules
Cargill Environmental Finance will take all reasonable precautions to prevent particulate matter from becoming airborne.

IDAPA 58.01.01.675 & 676 Fuel Burning Equipment – Particulate Matter & Standards for New Sources

The project will not discharge particulate above the applicable grain loading standard.

IDAPA 58.01.01.700--702 Particulate Matter – Process Weight Limitations

The emitting source is not considered process equipment and therefore the regulations do not apply to this source.

IDAPA 58.01.01.760 Rules for the Control of Ammonia from Dairy Farms

The proposed project is located on property leased from the Kettle Butte Dairy. The impact analysis for the emissions from the proposed generators demonstrates compliance with applicable standards at the boundary of the leased property. The dairy is owned operated separately from the generators. Therefore these rules do not apply to this source.

IDAPA 58.01.01.775 Rules for the Control of Odors

All reasonable precautions will be taken to control odors.

4 POTENTIAL EMISSION ESTIMATES

4.1. Equipment and Source Description

Two Genset electrical generators are proposed to be installed adjacent to each other. The two generators are described in Table 4-1. There are no emission controls proposed for the generators.

Table 4-1
Equipment Description

	Emission Controls
<u>Anaerobic Digester, Electric Generators, & Flare</u> <u>Anaerobic Digester</u> Biogas Production: 650,000 c.f. per day	Internal combustion engines and flare reduce emissions from the project but are not considered emission controls
<u>Bio-gas Conditioning System</u> Manufacturer: Paques Model: Thiopaq Type: Bioscrubber	The biogas conditioning system reduces SO ₂ emissions from the Project but are not considered emission controls
<u>Generator Engine No. 1</u> Manufacturer: GE Model: Jenbacher J412 GS-A81 Rated Power: 1,180 horsepower Ignition Type: Spark <u>Generator Engine No. 2</u> Manufacturer: GE Model: Jenbacher J412 GS-A81 Rated Power: 1,180 horsepower Ignition Type: Spark <u>Flare</u> Manufacturer: Perennial Energy Flare Heat Release Rate: 1,071,145 cal/sec	None

4.2. Source Parameters

Each of the generators will have a 10-inch diameter stack extending 31 feet above the ground surface. The vendor estimated, based on the design parameters and modeling the operation of the units, that the typical stack temperatures and velocity will be 743° K and 20.72 meters/second, respectively.

The flare will be manufactured by Perennial Energy and will be capable of combusting all of the gas produced from the digester. The flare is 20 feet above ground surface and will operate when the engines are offline due to an emergency situation or for maintenance.

4.3. Emission Factors

The emission factors used to estimate emissions from the generators came from multiple sources including AP-42, EPA's WebFire database and vendor information. The specific vendor information was determined most reliable, since it represents the specific operating conditions and equipment proposed for the project.

AP-42 Section 3.1 has published emission factor data for POTW digester gas-fired stationary gas turbines. In addition, AP-42 Section 3.2 has published emission factors for natural gas fired reciprocating engines. EPA's WebFire database provides limited data from internal combustion engines fueled from POTW digester gas. The WebFire data was collected in the early 1990s and is rated U (unrated)¹ by EPA. It does not provide supporting details about the source and operating conditions.

With the exception of particulate and SO₂, vendor information was used to estimate emissions for all of the primary pollutants. Vendor information for this type of emission source is limited. Cargill Environmental Finance discussed with IDEQ during its July 30, 2008 meeting that the vendor data is an estimate that may need to be refined after the performance source test data for CO, NO_x and VOC's is obtained. For example, vendor information for VOC emissions is based on tests conducted using EPA Method 18 data. The NSPS performance testing will be conducted using EPA Method 25A.

The PM₁₀ and PM_{2.5} emission factors were selected from AP-42 Section 3.2, Table 3.2 – Uncontrolled Emission Factors for 4-stroke Lean –Burn Engines. The table presents D-Rated PM-10 (filterable) and PM Condensable emission factors for natural gas lean burn reciprocating engines. The PM-10 emissions represent the sum of the PM-10 (filterable) and the PM Condensable fractions, since the condensable fraction is likely less than 10 microns.

¹ *Emission factor is developed from source tests which have not been thoroughly evaluated, research papers, modeling data, or other sources that may lack supporting documentation. The data are not necessarily "poor," but there is not enough information to rate the factors according to the rating protocol. "U" ratings are commonly found in L&E documents and FIRE rather than in AP 42.*

SO₂ emission factors were calculated from the anticipated average concentration of H₂S in the raw and conditioned bio-gas. The H₂S will be oxidized to SO₂ in either the engines or the flare. The H₂S concentration in the raw bio-gas is anticipated to average approximately 2,400 ppm. This concentration is consistent to similar systems. The bio-gas conditioning system is expected to reduce bio-gas concentrations to 350 ppm. Since the design of the operation allows the conditioning system to be bypassed, the flare SO₂ emission factor was calculated based on the 2,400 ppm H₂S concentration. Only conditioned bio-gas will be combusted in the genset engines to avoid equipment damage, therefore the emission factor for the engines is based on the 350 ppm H₂S concentration.

TAP emission data from generators using digester gas fuel is likely more representative than data from generators using natural gas fuel. AP-42 Section 3.2, Table 3.1-7 Emission Factors for Hazardous Air Pollutants from Digester Gas-Fired Stationary Gas Turbines presents D-Rated uncontrolled emission factors acetaldehyde, formaldehyde, nickel and selenium. Other HAPs are presented in the data, but reported as nondetectable. The remaining emission factors were extracted from the EPA WebFire database. This data was identified as the least reliable of the available data. It is unrated by EPA and provides no supporting information to evaluate its relevance to the proposed project.

AP-42 Section 13.5 has published emission factor data for industrial flares. The emission factors presented in this section of AP-42 were developed from petroleum refinery flare emissions and are not representative of a manure digester system. AP-42 Section 2.4 has published emission factors for municipal waste gas flares. However, these were also considered not be representative of a manure digester system.

A search of EPA's RACT/BACT/LAER Clearinghouse database (RBLC) revealed a permit that was issued in 2007 for an anaerobic digester at an Archer Daniels Midland facility in Iowa. The database presents criteria pollutant emission factors for the digester flares that represent Best Available Control Technology (RBLC ID #IA-0088). The emission factors are similar to those proposed for the generators.

The revised emission factors for the flare are those identified in EPA's RBLC. The emission factors for hazardous air pollutants (HAPs) were assumed the same as the emission factors used to estimate the generator emissions.

4.4. Emission Estimate

The hourly emission rates were calculated by multiplying the expected hourly BTU input by the respective emission factor. The BTU input was determined based on the bio-gas flow rate multiplied by the expected BTU value of 565 Btu/cf for the bio-gas. The maximum daily bio-gas production is estimated to be 650,000 cf/day. The hourly rate was estimated by dividing the maximum daily flow by 24 hours.

There is potential for the facility to bypass the bio-gas conditioning system if necessary for maintenance or in the event of malfunction. If the system is bypassed, bio-gas with higher concentration H_2S would be flared, resulting in higher emissions of SO_2 than when the conditioning system is operating as designed. The emission estimate presented in Table 4-2 reflects hourly emissions of SO_2 from the flare when it is combusting the un-conditioned bio-gas.

The generators will emit acrolein, isomers of xylene, styrene, toluene, selenium and trichloroethylene which are non-carcinogenic toxic air pollutants (TAPs) listed in IDAPA 58.01.01.585. The potential emission estimates for these compounds do not exceed their respective TAP screening emission levels (EL). The generators will also emit acetaldehyde, benzene, dichloromethane, formaldehyde, trichloroethylene, nickel and vinyl chloride which are carcinogenic TAPs listed in IDAPA 58.01.01.586. The potential emission estimates for acetaldehyde, dichloromethane, trichloroethylene, and vinyl chloride do not exceed their respective TAP EL. However, modeling was conducted for benzene, formaldehyde, and nickel because potential emission estimates exceed their respective TAP EL. Modeling demonstrates compliance with the Acceptable Ambient Concentration (AAC).

Table 4-2
Hourly Emission Estimate for Genset Generators and Flare

Pollutant	Genset (lbs/hr)	Flare (lbs/hr)
PM ₁₀	0.15	0.11
SO ₂ (Note 1)	1.6	10.9
NO _x	5.7	1.5
CO	15.6	3.1
VOC	1.3	5.5
Acetaldehyde	8.1E-04	8.1E-04
Acrolein	4.0E-04	4.0E-04
Benzene	1.1E-02	1.1E-02
Dichloromethane	1.5E-03	1.5E-03
Formaldehyde	2.9E-03	2.9E-03
Isomers of Xylene	2.1E-03	2.1E-03
Nickel	3.1E-05	3.1E-05
Selenium	1.7E-04	1.7E-04
Styrene	8.0E-04	8.0E-04
Toluene	4.0E-03	4.0E-03
Trichloroethylene	3.1E-04	3.1E-04
Vinyl Chloride	8.6E-04	8.6E-04

Note 1: hourly SO_2 emission calculations from the flare were calculated based on the anticipated average raw bio-gas concentration

4.5. Potential to Emit

The potential to emit if all of the generators are operating at maximum capacity for the proposed project is shown in Table 4-3. Please see Appendix D for detailed emission calculations.

The potential to emit was calculated based on the genset engines operating 8,760 hours/year. Table 4-3 presents the potential emissions if the maximum expected annual biogas flow were combusted through either of the generators and if the maximum expected annual biogas flow were combusted through the flare. The flare is located after the H₂S scrubbing system, but its potential emissions reflect the concentration of H₂S in the raw digester gas as a worst case scenario. No limitation on the operation of the flare will be necessary to maintain the PTE of any criteria pollutant below major source thresholds.

Table 4-3
Potential Annual Emissions for Genset Generators and Flare

Pollutant	Genset PTE (Note 1) (tons/yr)	Flare PTE (Note 2) (tons/yr)
PM ₁₀	0.7	0.5
SO ₂ (Note 3)	7	48
NO _x	25	7
CO	68	13
VOC	6	24
Acetaldehyde	3.6E-03	3.6E-03
Acrolein	1.7E-03	1.7E-03
Benzene	4.7E-02	4.7E-02
Dichloromethane	6.8E-03	6.8E-03
Formaldehyde	1.2E-02	1.2E-02
Isomers of Xylene	9.2E-03	9.2E-03
Nickel	1.3E-04	1.3E-04
Selenium	7.4E-04	7.4E-04
Styrene	3.5E-03	3.5E-03
Toluene	1.8E-02	1.8E-02
Trichloroethylene	1.3E-03	1.3E-03
Vinyl Chloride	3.8E-03	3.8E-03

Note 1: PTE is calculated based on 8,760 hours/year of Genset engine operation.

Note 2: PTE is calculated based on 8,760 hours/year of flare operation.

Note 3: SO₂ PTE from the flare is calculated using raw un-conditioned biogas.

4.6. Emission Limits

The concentration of the Hydrogen Sulfide (H₂S) entering the generators will be maintained below 350 ppm. As discussed during the pre-permit meeting with DEQ, Cargill Environmental Finance prefers mass based emission limits instead of concentration based limits in its permit. Cargill is committed to:

- Monitor H₂S concentration between the bio-gas conditioning system and Gensets
- Monitor bio-gas flowrate through the system.

The emission factors for the primary pollutants are estimates based on the best available information. Cargill will conduct performance source testing according to New Source Performance Standards. The testing will provide site specific information that will increase the understanding of emissions from the source. Cargill requests flexibility in its permit to allow revision of emissions estimates, as appropriate, when site specific information is collected.

5 AMBIENT IMPACT ASSESSMENTS

Air quality modeling was conducted consistent with the Idaho Department of Environmental Quality (IDEQ) Dispersion Modeling Guidelines (Guidelines), revised December 31, 2002, and the Ambient Air Quality Modeling Protocol for this project submitted to IDEQ and approved April 7, 2008.

Slight deviations were made after the approval of the Air Quality Modeling Protocol. Because the proposed project on Kettle Butte Dairy is considered to be a source separate from the dairy, the leased property boundary is considered to be the nearest public receptor. The closest boundary is approximately 100 feet (30.48 m) from the source. However, we selected the maximum modeled concentration generated by the model to demonstrate compliance with National Ambient Air Quality Standards (NAAQS). The Genset generators and the flare were modeled independently assessing the impact at the maximum impact which occurred outside the anticipated lease boundary for the site.

The stack velocity changed to 20.72 m/sec because of the change in manufacturer of the Gensets. The stack height was increased from 26 feet to 31 feet (9.45 m). The Screen3 outputs files are attached in Appendix D.

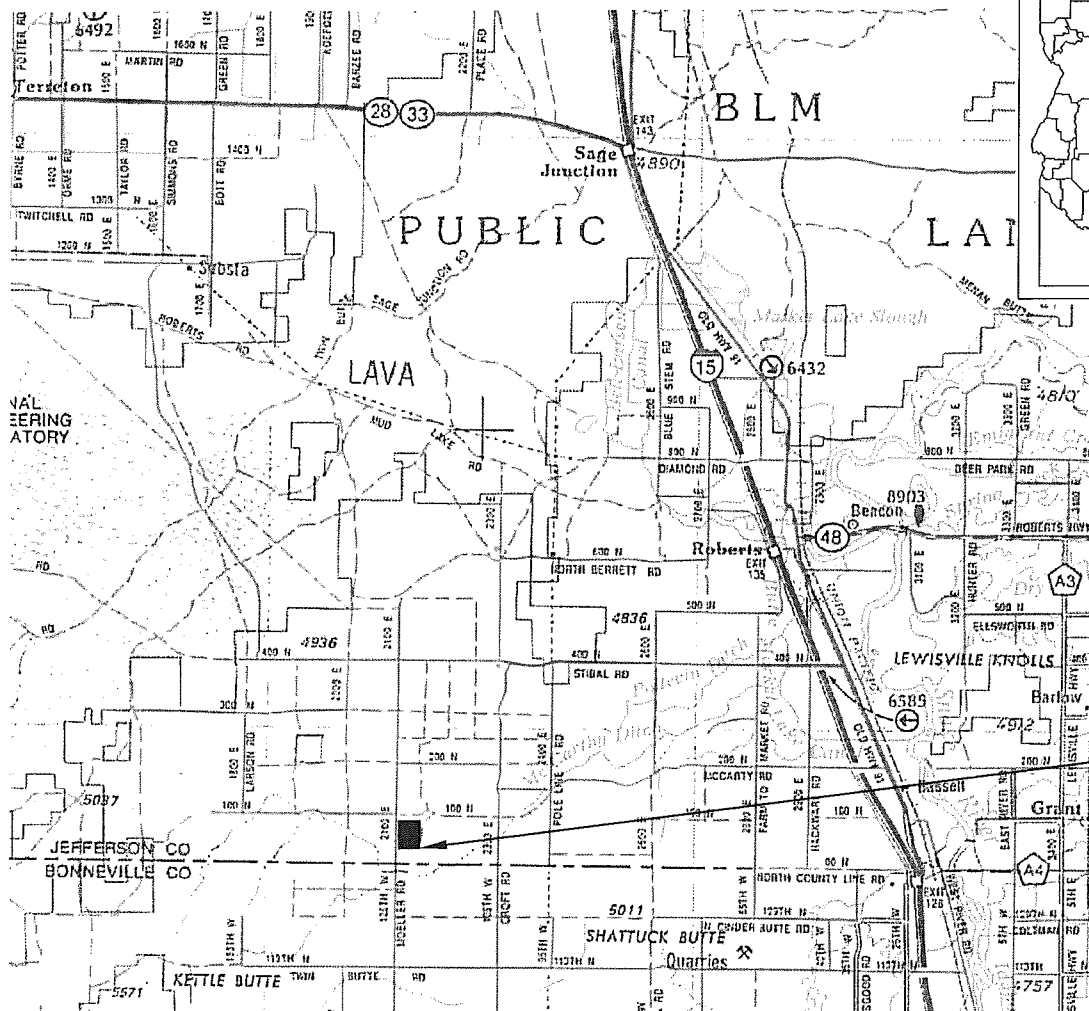
The table below shows the modeled results of the ambient air impacts from the Genset generators and the flare. The modeled impacts from criteria pollutants are compared to NAAQS. The modeled impacts from TAPs are compared to State of Idaho AACs.

Based on the analysis performed, the proposed stationary source will not cause or significantly contribute to a violation of any ambient air quality standard and demonstrates pre-construction compliance with IDAPA 58.01.01, Section 161 with regards to TAP emissions.

Table 5-1
Modeling Results

Pollutant	Averaging period	Modeled Ambient Concentrations ($\mu\text{g}/\text{m}^3$)		NAAQS/AAC ($\mu\text{g}/\text{m}^3$)
		Gensets Engines	Flare	
PM10	24-hr	78	74	150
	Annual	27	26	50
SO2	3-hr	158	310	1,300
	24-hr	81	149	365
	Annual	19	33	80
NO2	Annual	46	20	100
CO	1-hr	4941	3685	40,000
	8-hr	3238	2359	10,000
Pb	Qtrly	n/a	n/a	1.5
Acetaldehyde	Annual	Below TAP EL	Below TAP EL	n/a
Acrolein	24-hr	Below TAP EL	Below TAP EL	n/a
Benzene	Annual	0.11	0.04	0.12
Dichloromethane	Annual	Below TAP EL	Below TAP EL	0.24
Formaldehyde	Annual	0.03	0.01	0.077
Isomers of Xylene	24-hr	Below TAP EL	Below TAP EL	n/a
Nickel	Annual	0.0003	0.0001	0.004
Selenium	24-hr	Below TAP EL	Below TAP EL	n/a
Styrene	24-hr	Below TAP EL	Below TAP EL	n/a
Toluene	24-hr	Below TAP EL	Below TAP EL	n/a
Trichloroethylene	24-hr	Below TAP EL	Below TAP EL	n/a
	Annual	Below TAP EL	Below TAP EL	n/a
Vinyl Chloride	Annual	Below TAP EL	Below TAP EL	n/a

FIGURES



APPROXIMATE
PROJECT
LOCATION

APPROXIMATE
SITE
LOCATION
NEAREST
INTERSECTION
IS 2100E, 100N

Source: Idaho Atlas and Gazetteer, 3rd Edition, Delome



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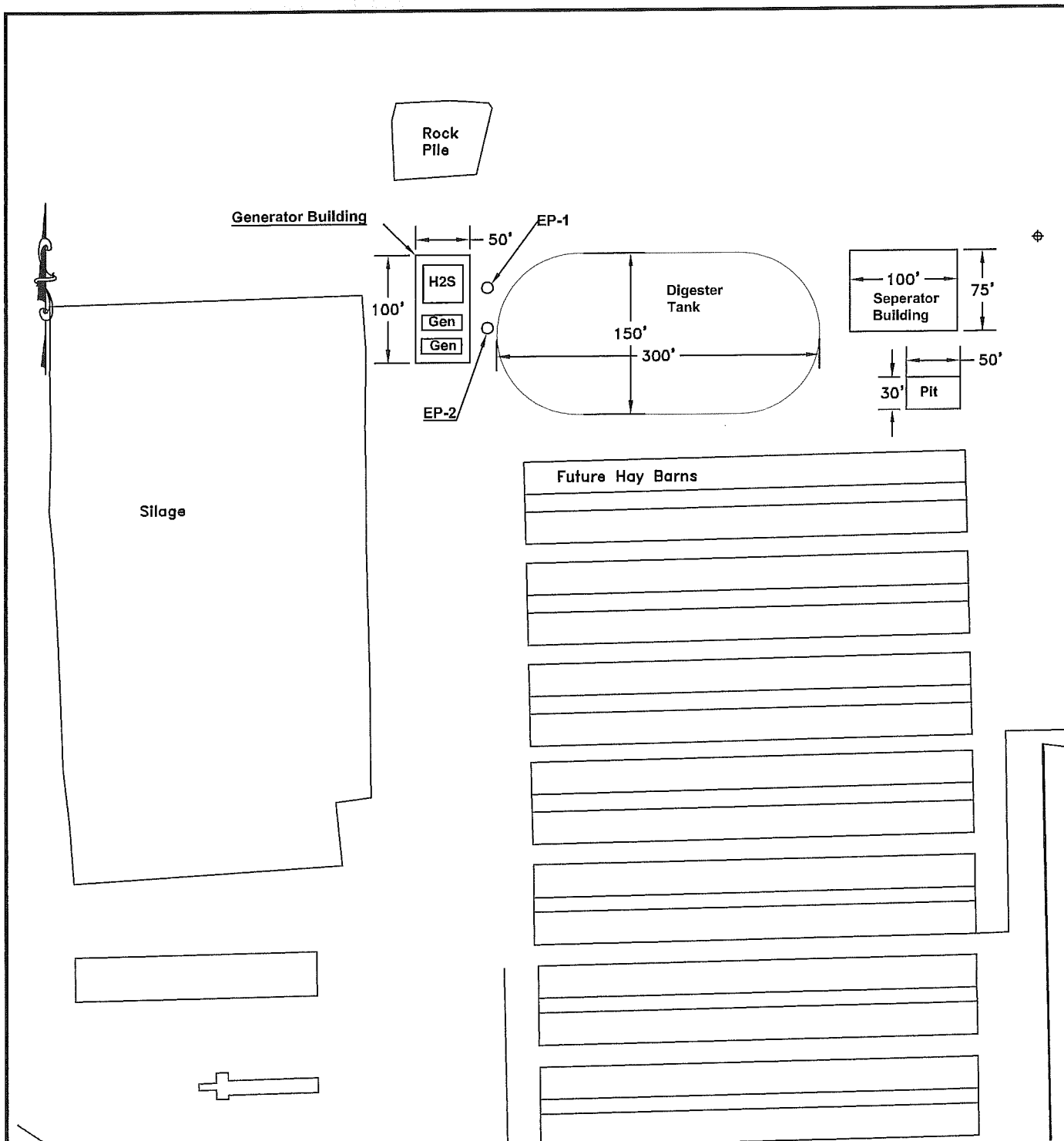
PROJECT NO. 96227
DRAWN: AUG 2008
DRAWN BY: CE
CHECKED BY: KW
FILE NAME:

SITE LOCATION MAP

Kettle Butte Dairy
20 N 2100 E
Roberts, ID

Figure

1



Facility Drawing provided from Dioptra Geomatics, Aug 2008

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Scale shown in Feet



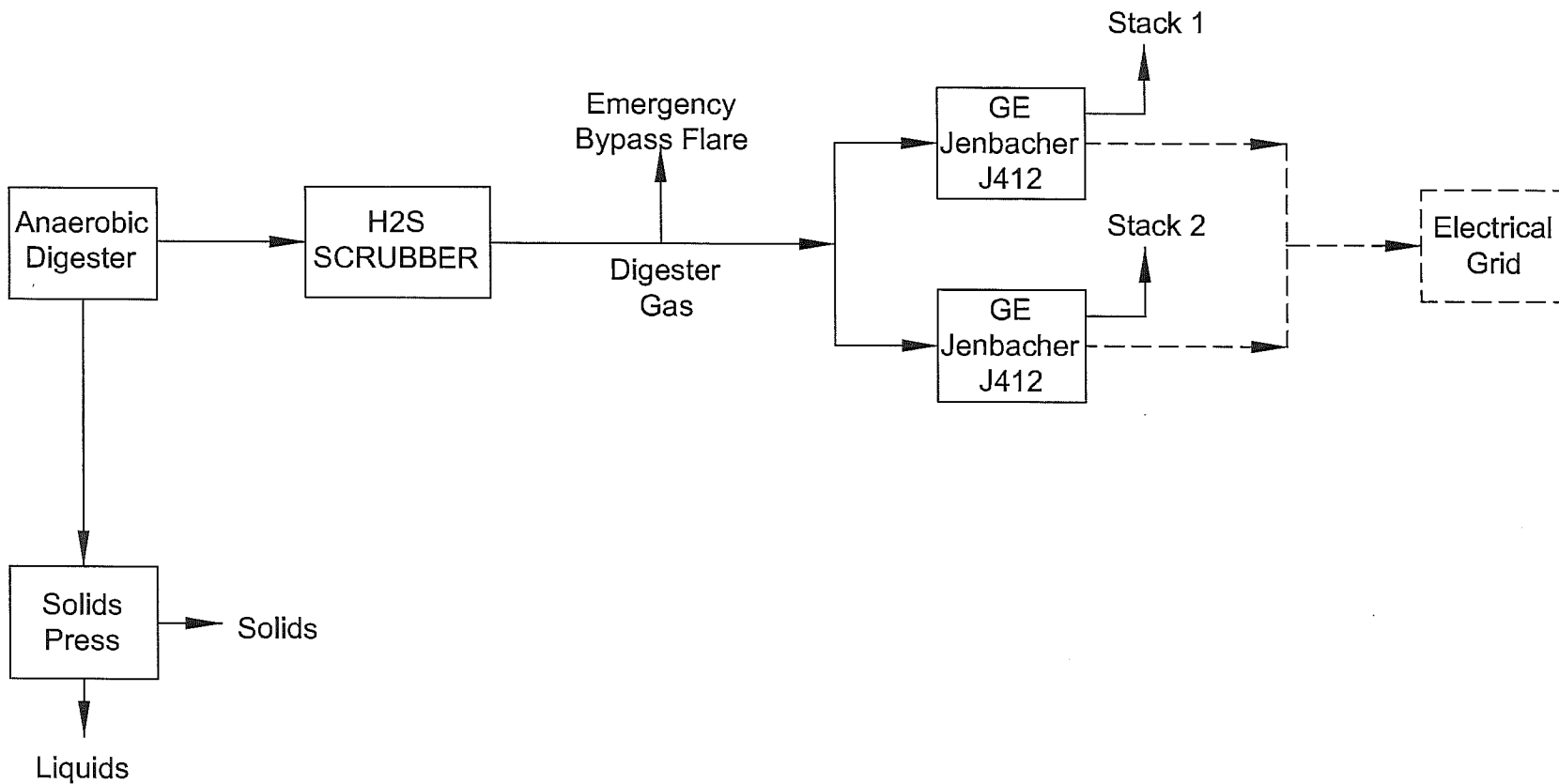
PROJECT NO. 96227
DRAWN: AUG 2008
DRAWN BY: CE
CHECKED BY: KW
FILE NAME:

SITE DETAIL MAP

Kettle Butte Dairy
20 N 2100 E
Roberts, ID

Figure

2



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PROJECT NO.	96227
DRAWN:	AUG 2008
DRAWN BY:	CE
CHECKED BY:	KW
FILE NAME:	

PROCESS FLOW CHART

Kettle Butte Dairy
20 N 2100 E
Roberts, ID

Figure

3

APPENDIX A

Permit to Construct Application Forms



DEQ AIR QUALITY PROGRAM
 1410 N. Hilton, Boise, ID 83706
 For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
 04/03/07

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	Cargill Environmental Finance		
2. Facility Name	Kettle Butte Dairy	3. Facility ID No.	1
4. Brief Project Description - One sentence or less	Dairy Anaerobic Digester which captures biogas to produce electricity through gensets.		

PERMIT APPLICATION TYPE

5. <input checked="" type="checkbox"/> New Facility	<input type="checkbox"/> New Source at Existing Facility	<input type="checkbox"/> Unpermitted Existing Source
<input type="checkbox"/> Modify Existing Source: Permit No.: _____ Date Issued: _____		
<input type="checkbox"/> Required by Enforcement Action: Case No.: _____		
6. <input checked="" type="checkbox"/> Minor PTC <input type="checkbox"/> Major PTC		

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form GI – Facility Information	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU0 – Emissions Units General	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU5 – Boiler Information Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form BCE - Baghouses Control Equipment	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form SCE - Scrubbers Control Equipment	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forms EI-CP1 - EI-CP4 - Emissions Inventory-- criteria pollutants (Excel workbook, all 4 worksheets)	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	PP – Plot Plan	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form FRA – Federal Regulation Applicability	<input type="checkbox"/>

DEQ USE ONLY

Date Received

Project Number

Payment / Fees Included?

Yes ☐ No ☐

Check Number



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Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	Cargill Environmental Finance
2. Facility Name (if different than #1)	Kettle Butte Dairy
3. Facility I.D. No.	1
4. Brief Project Description:	Dairy Anaerobic Digester which captures biogas to produce electricity through gensets
FACILITY INFORMATION	
5. Owned/operated by: (✓if applicable)	<input type="checkbox"/> Federal government <input type="checkbox"/> County government <input type="checkbox"/> State government <input type="checkbox"/> City government
6. Primary Facility Permit Contact Person/Title	Ryan Coleman - Project Engineer
7. Telephone Number and Email Address	208-345-2324 or/cell 208-340-6421 ryan_coleman@cargill.com
8. Alternate Facility Contact Person/Title	Gary Rimmey Senior Operations and Maintenance Manager
9. Telephone Number and Email Address	984-952-3887 gary_rimmey@cargill.com
10. Address to which permit should be sent	Mail stop 139 12700 Whitewater Dr. (AND) 1410 Camelback LN. Suite 229
11. City/State/Zip	Minnetonka, Minnesota 55343 Boise, ID 83702
12. Equipment Location Address (if different than #10)	Kettle Butte Dairy 20 N. 2100 E.
13. City/State/Zip	Roberts, ID 83444
14. Is the Equipment Portable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15. SIC Code(s) and NAISC Code	Primary SIC: 4911 Secondary SIC (if any): NAICS: 237130
16. Brief Business Description and Principal Product	Anaerobically digest cow manure and capture methane to power engine and produce electricity.
17. Identify any adjacent or contiguous facility that this company owns and/or operates	
PERMIT APPLICATION TYPE	
18. Specify Reason for Application	<input checked="" type="checkbox"/> New Facility <input type="checkbox"/> New Source at Existing Facility <input type="checkbox"/> Unpermitted Existing Source <input type="checkbox"/> Modify Existing Source: Permit No.: _____ Date Issued: _____ <input type="checkbox"/> Permit Revision <input type="checkbox"/> Required by Enforcement Action: Case No.: _____
CERTIFICATION	
IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Ryan Coleman - Project Engineer
20. RESPONSIBLE OFFICIAL SIGNATURE	Date: _____
21. <input checked="" type="checkbox"/> Check here to indicate you would like to review a draft permit prior to final issuance.	



DEQ AIR QUALITY PROGRAM
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Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION							
Company Name: Cargill Environmental Finance		Facility Name: Kettle Butte			Facility ID No: 1		
Brief Project Description:		Dairy Anaerobic Digester that collects biogas & generates electricity					
EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION							
1. Emissions Unit (EU) Name:		FLARE					
2. EU ID Number:		EP-3					
3. EU Type:		<input checked="" type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:				Date Issued:	
4. Manufacturer:		PERENNIAL ENERGY					
5. Model:		ENCLOSED GROUND FLARE					
6. Maximum Capacity:		650,000 CF/DAY					
7. Date of Construction:		9/15/2008					
8. Date of Modification (if any)		NA					
9. Is this a Controlled Emission Unit?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, complete the following section. If No, go to line 18.					
EMISSIONS CONTROL EQUIPMENT							
10. Control Equipment Name and ID:		NA					
11. Date of Installation:		NA		12. Date of Modification (if any):		NA	
13. Manufacturer and Model Number:		NA					
14. ID(s) of Emission Unit Controlled:		NA					
15. Is operating schedule different than emission units(s) involved?		<input type="checkbox"/> Yes <input type="checkbox"/> No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?		<input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency		Pollutant Controlled					
		PM	PM10	SO ₂	NO _x	VOC	CO
		NA	NA	NA	NA	NA	NA
17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.							
EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)							
18. Actual Operation		IN AN EMERGENCY OR MAINTENANCE SITUATION					
19. Maximum Operation		EMISSION ESTIMATE IS BASED ON 8,760 HOURS/YEAR					
REQUESTED LIMITS							
20. Are you requesting any permit limits?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If Yes, check all that apply below)					
<input type="checkbox"/> Operation Hour Limit(s):							
<input type="checkbox"/> Production Limit(s):							
<input type="checkbox"/> Material Usage Limit(s):							
<input type="checkbox"/> Limits Based on Stack Testing		Please attach all relevant stack testing summary reports					
<input type="checkbox"/> Other:							
21. Rationale for Requesting the Limit(s):		NA					



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PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION				
Company Name: Cargill Environmental Finance		Facility Name: Kettle Butte Dairy		Facility ID No: 1
Brief Project Description:		Dairy Anaerobic Digester that collects biogas & makes electricity		
EXEMPTION				
Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.				
ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS				
1. Type of Unit: <input checked="" type="checkbox"/> New Unit <input type="checkbox"/> Unpermitted Existing Unit <input type="checkbox"/> Modification to a Unit with Permit #: _____ Date Issued: _____				
2. Use of Engine: <input type="checkbox"/> Normal Operation <input type="checkbox"/> Emergency <input type="checkbox"/> Back-up <input checked="" type="checkbox"/> Other: Renewable Energy				
3. Engine ID Number: EP-1		4. Rated Power: <input checked="" type="checkbox"/> 1180 Brake Horsepower(bhp) <input checked="" type="checkbox"/> 848 Kilowatts(kW)		
5. Construction Date: 9/15/08		6. Manufacturer: GE		7. Model: Jenbacher J 412 GS-A81
8. Date of Modification (if applicable): NA		9. Serial Number (if available): NA		10. Control Device (if any): NA
FUEL DESCRIPTION AND SPECIFICATIONS				
11. Fuel Type	<input type="checkbox"/> Diesel Fuel (#) (gal/hr)	<input type="checkbox"/> Gasoline Fuel (gal/hr)	<input type="checkbox"/> Natural Gas (cf/hr)	<input checked="" type="checkbox"/> Other Fuels (unit:cf/hr)
12. Full Load Consumption Rate				15,847
13. Actual Consumption Rate				13,542
14. Sulfur Content wt%		N/A	N/A	
OPERATING LIMITS & SCHEDULE				
15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): NA				
16. Operating Schedule (hours/day, months/year, etc.): 24 hours a day, 365 days a year				



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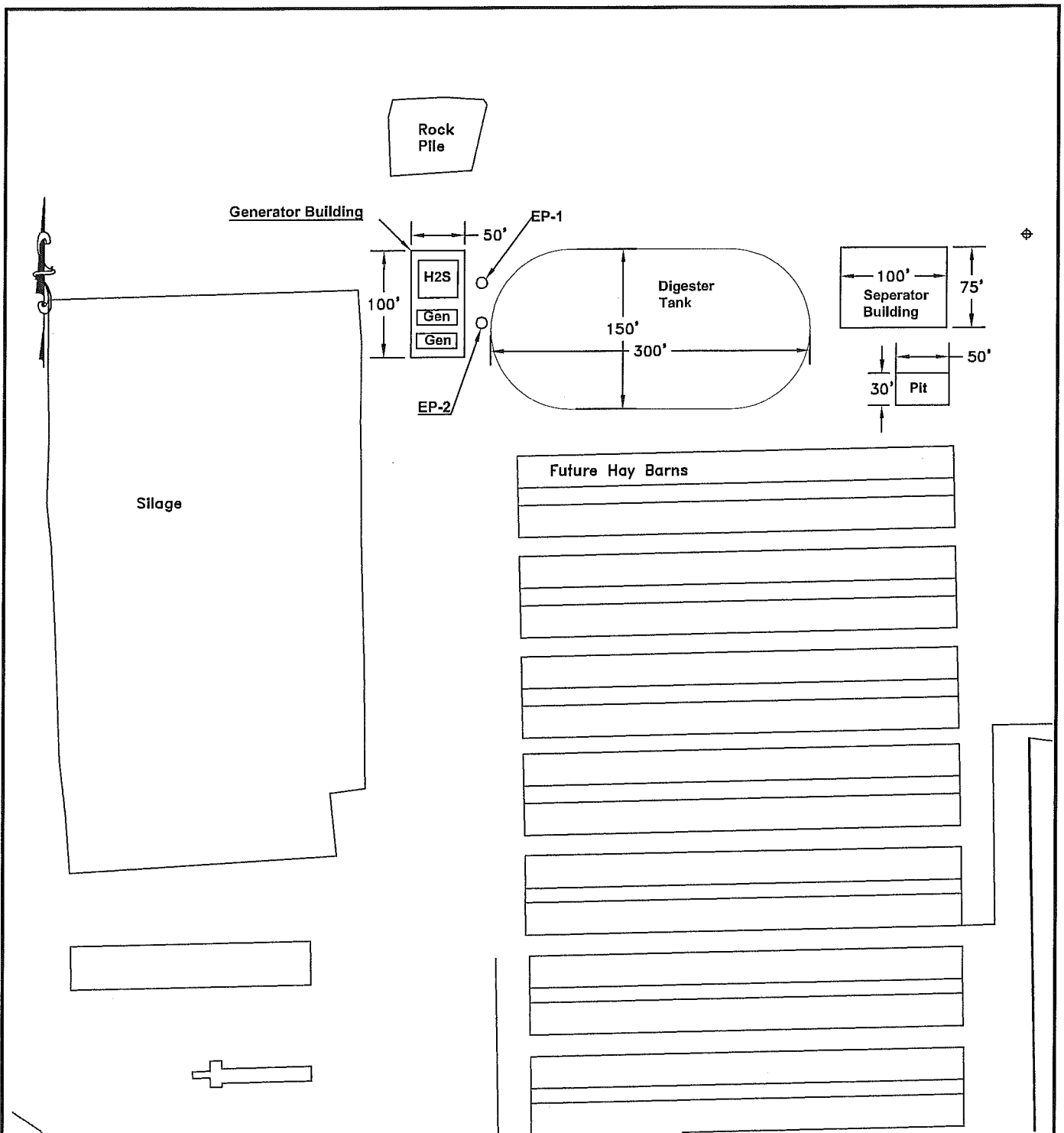
PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION				
Company Name: Cargill Environmental Finance		Facility Name: Kettle Butte Dairy		Facility ID No: 1
Brief Project Description:		Dairy Anaerobic Digester that collects biogas & makes electricity		
EXEMPTION				
Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.				
ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS				
1. Type of Unit: <input checked="" type="checkbox"/> New Unit <input type="checkbox"/> Unpermitted Existing Unit <input type="checkbox"/> Modification to a Unit with Permit #: _____ Date Issued: _____				
2. Use of Engine: <input type="checkbox"/> Normal Operation <input type="checkbox"/> Emergency <input type="checkbox"/> Back-up <input checked="" type="checkbox"/> Other: Renewable Energy				
3. Engine ID Number: EP-2		4. Rated Power: <input checked="" type="checkbox"/> 1180 Brake Horsepower(bhp) <input checked="" type="checkbox"/> 848 Kilowatts(kW)		
5. Construction Date: 9/15/08		6. Manufacturer: GE		7. Model: Jenbacher J 412 GS-A81
8. Date of Modification (if applicable): NA		9. Serial Number (if available): NA		10. Control Device (if any): NA
FUEL DESCRIPTION AND SPECIFICATIONS				
11. Fuel Type	<input type="checkbox"/> Diesel Fuel (#) (gal/hr)	<input type="checkbox"/> Gasoline Fuel (gal/hr)	<input type="checkbox"/> Natural Gas (cf/hr)	<input checked="" type="checkbox"/> Other Fuels (unit:cf/hr)
12. Full Load Consumption Rate				15,847
13. Actual Consumption Rate				13,542
14. Sulfur Content wt%		N/A	N/A	
OPERATING LIMITS & SCHEDULE				
15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): NA				
16. Operating Schedule (hours/day, months/year, etc.): 24 hours a day, 365 days a year				

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Facility Drawing provided from Dioptra Geomatics, Aug 2008

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150 0 75 150
Scale shown in Feet



PROJECT NO. 96227
DRAWN: AUG 2008
DRAWN BY: CE
CHECKED BY: KW
FILE NAME:

SITE DETAIL MAP

Kettle Butte Dairy
20 N 2100 E
Roberts, ID

Figure

2

Modeling Information - Impact Analysis Form MI1



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Cargill Environmental Finance
Facility Name:	Kettle Butte Dairy
Facility ID No.:	1
Brief Project Description:	Dairy anaerobic digester which captures biogas to produce electricity through gensets.

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	Averaging Period	Significant Impact Analysis Results ($\mu\text{g}/\text{m}^3$)	Significant Contribution Level ($\mu\text{g}/\text{m}^3$)	Full Impact Analysis Results ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)	Total Ambient Impact ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	Percent of NAAQS
PM ₁₀	24-hour	5.25	5	5.25	73.00	78.25	150	52%
	Annual	1.05	1	1.05	26.00	27.05	50	54%
SO ₂	3-hr	123.72	25	123.72	34.00	157.72	1300	12%
	24-hr	54.99	5	54.99	26.00	80.99	365	22%
	Annual	11.00	1	11.00	8.00	19.00	80	24%
NO ₂	Annual	29.49	1	29.49	17.00	46.49	100	46%
CO	1-hr	1,340.47	2000	1,340.47	3,600.00	4,940.47	10000	49%
	8-hr	938.33	500	938.33	2,300.00	3,238.33	40000	8%



DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name: Cargill Environmental Finance

Facility Name: Kettle Butte Dairy

Facility ID No.: 1

Brief Project Description: Dairy anaerobic digester which captures biogas to produce electricity through gensets.

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	Stack ID	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North (°)	Initial Vertical Dimension (m)	Initial Horizontal Dimension (m)
Area Source(s)										
name of the emissions unit1										
name of the emissions unit2										
name of the emissions unit3										
name of the emissions unit4										
name of the emissions unit5										
name of the emissions unit6										
name of the emissions unit7										
name of the emissions unit8										
name of the emissions unit9										
name of the emissions unit10										
Volume Source(s)										
name of the emissions unit11										
name of the emissions unit12										
name of the emissions unit13										
name of the emissions unit14										
name of the emissions unit15										
name of the emissions unit16										
name of the emissions unit17										
name of the emissions unit18										
name of the emissions unit19										
(insert more rows as needed)										



Please see instructions on page 2 before filling out the form.

Brief Project Description:	Dairy anaerobic digester which captures biogas to produce electricity through gensets.
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7.

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Page 1



DEQ AIR QUALITY PROGRAM
 1410 N. Hilton, Boise, ID 83706
 For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
 03/26/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Cargill Environmental Finance	Facility Name: Kettle Butte Dairy	Facility ID No: 1
Brief Project Description: Dairy Anaerobic Digester which captures biogas to produce electricity through gensets		
APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES* * If YES, applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES* *If YES, please identify sub-part: <u>JJJJ</u>
3. Will this project be subject to a MACT (<u>M</u> aximum <u>A</u> chievable <u>C</u> ontrol <u>T</u> echnology) regulation? (40 CFR part 63)	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES* *If YES, please identify sub-part: _____
THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT		
4. Will this project be subject to a NESHAP (<u>N</u> ational <u>E</u> mission <u>S</u> tandards for <u>H</u> azardous <u>A</u> ir <u>P</u> ollutants) regulation? (40 CFR part 61)	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES* *If YES, please identify sub-part: _____
5. Will this project be subject to PSD (<u>P</u> revention of <u>S</u> ignificant <u>D</u> eterioration)? (40 CFR section 52.21)	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES
6. Was netting done for this project to avoid PSD?	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES* *If YES, please attach netting calculations
<p align="center">IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT</p>		

APPENDIX B

Air Quality Modeling Protocol



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

RECEIVED

APR 28 2008

APR 24 2008

DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE AQ PROGRAM

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Jonathan Pettit
Air Quality Permit Analyst
Idaho Department of Environmental Quality
Air Quality Division
1410 N. Hilton
Boise, Idaho 83706-1255

Dear Mr. Pettit:

This is in response to your request for guidance regarding the use of Air to Fuel Ratio controllers (AFR) on lean burn and rich burn engines that are subject to the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines at 40 CFR Part 60, Subpart JJJJ. Specifically, you request clarification of the provisions at 40 CFR Part 60, Section 60.4243(g) regarding: 1) whether use of an AFR is an enforceable requirement for engines that use three way catalysts; and 2) does the use of an AFR apply to both lean burn and rich burn engines that use three way catalysts.

Although not stated explicitly in 40 CFR Part 60, Subpart JJJJ, the use of an AFR is an enforceable requirement for rich burn engines that use three way catalysts. Question 10.2.2 in the 40 CFR Part 60, Subpart JJJJ Response To Comment document clarifies this requirement by stating that:

An AFR is necessary and must be included with the operation of three way catalysts on rich burn engines and will have to be operated in an appropriate manner to ensure the proper engine operation and to minimize emissions.

Three way catalysts simultaneously reduce oxides of nitrogen (NO_x), hydrocarbons (HC) and carbon monoxide (CO) through a series of reduction and oxidation reactions for engines that operate at or near stoichiometric conditions. The AFR is necessary because it maintains the appropriate air to fuel ratio so that these oxidation and reduction reactions can take place in the catalyst. In their absence, the three way catalyst would not work properly, and the engine would be unable to consistently comply with the emission requirements specified in 40 CFR Part 60, Subpart JJJJ.